

**REMARKS**

Claims 1 and 2 have been amended to improve antecedent basis and the clarity of the claims. No new matter has been added.

The Final Office Action mailed March 12, 2004, has been received and reviewed. Claims 1-3, 6, 7, and 21 are currently pending in the application. Claims 1-3, 6, 7, and 21 stand rejected. Applicant proposes to amend claims 1 and 2 and respectfully requests reconsideration of the application as proposed to be amended herein.

Applicant has also reinstated claims 4, 5, and 8-10. These claims were unintentionally and inadvertently canceled along with the nonelected claims of Group B (claims 11-20) in Applicant's response mailed December 3, 2003. However, as explained in Applicant's Response to the Election of Species Restriction Requirement mailed on July 7, 2003, Applicant considers claim 1 to be generic to the species of Group A since each and every claim of claims 2-10 are embraced by the limitations on independent claim 1.

Applicant respectfully submits that the amendments place the application in condition for allowance. Alternatively, the amendments put the application in better form for consideration on appeal. These amendments are necessary and could not have been presented earlier because they are submitted in response to the Examiner's enablement rejection of claim 1.

**35 U.S.C. § 112 Claim Rejections**

Claim 1 stands rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has amended claim 1 and respectfully requests that the rejection be withdrawn.

### 35 U.S.C. § 102(b) Anticipation Rejections

#### Anticipation Rejection Based on U.S. Patent No. 5,840,227 to Bourdoncle et al.

Claim 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,840,227 to Bourdoncle *et al.* (“Bourdoncle”). Applicant respectfully traverses this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Bourdoncle discloses an internal thermal protection for a thruster structure. The internal thermal protection is a fiber-reinforced elastomer layer that is made by mixing an elastomer base with fibers without dissolving the elastomer base in a solvent. The elastomer base is a polychloroprene or a silicone gum that vulcanizes at a temperature above 120°C and has a viscosity of less than 1500 Pa.s at 50°C. The elastomer base and the fibers are mixed to form a powdered, solid composition. The fiber-reinforced elastomer layer is molded *in situ* by filling the thruster structure with the solid composition and compacting the solid composition. Since the elastomer base has a low viscosity, the fiber-reinforced elastomer layer is not formed into a sheet.

Claim 1, as proposed to be amended, recites a method of insulating a rocket motor case loaded with a solid propellant. The method comprises preparing insulation from a composition comprising a cross-linkable liquid polymer and carbon fibers, the composition including the cross-linkable liquid polymer in a sufficient concentration to permit the carbon fibers to be dispersed into the composition by mixing under substantially solvent-free conditions. The composition is cured to form the insulation. The insulation is shaped into a sheet and used to insulate the rocket motor case.

Bourdoncle does not expressly or inherently describe each and every element of claim 1 because Bourdoncle does not disclose the limitations of “shaping the insulation into a sheet” and “insulating the rocket motor case with the sheet of insulation.” The Examiner states “that figs 2e

and 2g of Bourdoncle et al teach shaping the insulation into at least one sheet” because “[a] sheet of material within cylindrical and conical form is within the metes and bounds of the instant claim.” Office Action of March 12, 2004, p. 2. However, contrary to the Examiner’s assertions, FIG. 2e shows that the solid composition is used to fill an annular gap between an extender of the thruster structure and an annular tool. The solid composition is then compacted to form the thermal protection on the extender. As such, the thermal protection is not shaped into a sheet. FIG. 2g shows that the thermal protection is formed on a bottom surface of the thruster structure in a similar manner. Namely, the solid composition is inserted into the bottom of the thruster structure and then compacted to form the thermal protection.

The Examiner also states that “the breadth of the instant claim does not prevent a step of forming a sheet of insulation simultaneously with a step of insulating.” *Id.* at p. 6. However, since claim 1 recites that the insulation is shaped into a sheet and that the sheet of insulation is used to insulate the rocket motor case, the sheet is first formed and then used to insulate the rocket motor case.

Furthermore, Bourdoncle explicitly states that its thermal protection is not formed into a sheet and, in fact, is unsuitable for forming into a sheet. See column 3, lines 1-10 and column 5, lines 38-40. As such, Bourdoncle does not disclose shaping the insulation into a sheet and, therefore, necessarily does not disclose that the sheet is used to insulate the rocket motor case.

Since Bourdoncle does not expressly or inherently describe each and every element of claim 1, the anticipation rejection of claim 1 is improper and should be withdrawn.

### **35 U.S.C. § 103(a) Obviousness Rejections**

#### **Obviousness Rejection Based on Bourdoncle in view of the Admitted Prior Art or U.S. Patent No. 6,606,852 to Harvey et al.**

Claims 2, 3, 6, and 7 stand rejected under 35 U.S.C. § 103(a) (“Section 103”) as being unpatentable over Bourdoncle in view of the admitted prior art as set forth on page 8, lines 23-24 or U.S. Patent No. 6,606,852 to Harvey et al. (“Harvey”). Applicant respectfully traverses this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103 rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

The obviousness rejections of claims 2, 3, 6, and 7 are improper because the cited references do not provide a motivation to combine to produce the claimed invention.

The teachings of Bourdoncle are as previously described.

The admitted prior art (page 8, lines 23-24 of the as-filed application) discloses that TRILENE<sup>®</sup> 67A and TRILENE<sup>®</sup> 77A are liquid EPDM terpolymers. However, contrary to the Examiner's assertions, nothing in the cited section of the as-filed application discloses that these liquid EPDM terpolymers have been used in conventional rocket motor insulation. Therefore, the Examiner's statement that "the admitted prior art . . . teach[es] the well-known use of liquid EPDM (e.g., TRILENE<sup>®</sup> 67A) in the rocket motor insulation art" is a mischaracterization of the admitted prior art. Office Action of March 12, 2004, p. 3.

Harvey discloses a rocket motor insulation having an elastomer base polymer and silica particles treated with a hydrophobic coating. The elastomer base polymer is an organic elastomeric polymer, such as an EPDM rubber. The elastomer base polymer includes from about 35-80 weight percent of the total weight of the rocket motor insulation. The rocket motor insulation also includes a plasticizer, such as TRILENE<sup>®</sup> 67A, that is present at 15 or 30 parts per hundred.

To provide a motivation or suggestion to combine, the prior art or the knowledge of a person of ordinary skill in the art must "suggest the desirability of the combination" or provide "an objective reason to combine the teachings of the references." M.P.E.P. § 2143.01. As explained by the United States Court of Appeals for the Federal Circuit, "it is fundamental that rejections under 35 U.S.C. § 103 must be based on evidence." *In re Lee*, 61 U.S.P.Q.2d 1430, 277 F.3d 1338, 1342 (Fed.Cir. 2002). When patentability depends on a question of obviousness,

“rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references” is “the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis.” *Id.* This rigorous showing requires the Examiner to “explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious.” *Id.* Furthermore, the Examiner “cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies.” *Id.* at 1345.

As acknowledged by the Examiner, Bourdoncle “does not teach using a crosslinkable EPDM terpolymer as the crosslinkable liquid elastomer base.” Office Action of March 12, 2004, p. 3. As such, Bourdoncle does not teach or suggest the limitation of “preparing a composition comprising a cross-linkable EPDM terpolymer and carbon fibers, the cross-linkable EPDM terpolymer comprising a cross-linkable liquid EPDM terpolymer,” as recited in claim 2. Therefore, the Examiner relies on the admitted prior art and Harvey as teaching this limitation. The Examiner states that “[b]oth the admitted prior art and Harvey et al teach the well-known use of liquid EPDM (e.g., TRILENE<sup>®</sup> 67A in the rocket motor insulation art.” *Id.* The Examiner further states that the cited references “are combinable because they are analogous with respect to insulation for rocket motors. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the crosslinkable liquid EPDM terpolymer of the admitted prior art or Harvey et al as the crosslinkable polymer of Bourdoncle et al in order to produce a durable and effective insulation layer.” *Id.* at p. 3-4.

However, this reason offered by the Examiner in support of combining the cited references is conclusory and is not supported by objective evidence of record. The fact that the cited references are related to insulation for rocket motors does not provide a proper reason to support their combination because the fact that references can be combined is not sufficient to establish a *prima facie* case of obviousness unless the cited references also suggest the desirability of the combination. M.P.E.P. § 2143.10. As previously mentioned, the admitted prior art does not disclose that liquid EPDMs are used in the rocket motor insulation art. Rather, the section of the as-filed specification referred to by the Examiner as the admitted prior art merely discloses two examples of commercially available, liquid EPDMs and, as such, does not

provide any motivation to use the liquid EPDMs in an insulation for rocket motors. Since the admitted prior art provides no such motivation, it appears that the Examiner's conclusion of obviousness is based on improper hindsight reasoning.

In addition, nothing in Bourdoncle and Harvey provides any motivation or suggestion to replace the polychloroprene or silicone gum in Bourdoncle with the liquid EPDM of Harvey. Bourdoncle discloses that polychloroprene or silicone gum is used as its elastomer base but provides no motivation or suggestion to utilize other materials, such as a liquid EPDM. Harvey also provides no motivation or suggestion to utilize liquid EPDM as the elastomer base in other rocket motor insulations. Furthermore, in Harvey, the liquid EPDM (TRILENE<sup>®</sup> 67A) is present in small amounts as a plasticizer. The liquid EPDM is not present in a sufficient concentration to permit the carbon fibers to be dispersed into the composition by mixing under substantially solvent-free conditions, as recited in claim 2. Since Harvey only discloses using small amounts of the liquid EPDM, one of ordinary skill in the art would not be motivated, after reading Harvey and Bourdoncle, to use the liquid EPDM of Harvey instead of the polychloroprene or silicone gum in Bourdoncle to produce the claimed invention.

Claims 3, 6, and 7 are allowable as depending from an allowable base claim.

Claim 6 is further allowable because the cited references do not teach or suggest that at least about 90 weight percent of the cross-linkable EPDM terpolymer in the composition consists of the cross-linkable liquid EPDM terpolymer. While the rocket motor insulation in Harvey includes a solid and a liquid cross-linkable EPDM terpolymer, the liquid EPDM terpolymer is present in a lower amount relative to the solid EPDM polymer.

Obviousness Rejection Based on Bourdoncle in view of the Admitted Prior Art or Harvey and Further in View of U.S. Patent No. 4,507,165 to Herring

Claim 21 stands rejected under Section 103 as being unpatentable over Bourdoncle in view of the admitted prior art as set forth on page 8, lines 23-24 or Harvey, as applied to claim 2 above, and further in view of U.S. Patent No. 4,507,165 to Herring ("Herring"). Claim 21 depends from claim 2 and, therefore, is allowable as depending from an allowable base claim. Applicant respectfully traverses this rejection, as hereinafter set forth.

The teachings of Bourdoncle, the admitted prior art, and Harvey are as previously described.

Herring discloses an elastomeric insulation material that includes 100 parts by weight of a crosslinked elastomer polymer and 10-100 parts by weight of an organic fiber. The crosslinked elastomer polymer and the organic fibers are compounded by conventional mixing and milling equipment. Calendered sheets of the elastomeric insulation material are produced and are applied to a rocket motor case by wrapping a bladder mandrel with the calendered sheet, inserting the mandrel into the rocket motor case, and inflating the bladder to press the elastomeric insulation material against the rocket motor case.

As acknowledged by the Examiner, Bourdoncle does not disclose shaping the insulation into a sheet prior to insulating the rocket motor case. Office Action of March 12, 2004, p. 5. Therefore, the Examiner relies on Herring as teaching this limitation. The Examiner states that Bourdoncle and Herring “are combinable because they are analogous with respect to molding rocket motor case insulation. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to shape the insulation of Bourdoncle et al into a sheet as taught by Herring in order to allow for the insulation of Bourdoncle et al to be used in various methods of forming insulated rocket motor cases.” *Id.*

However, this reason offered by the Examiner in support of combining the cited references is conclusory and is not supported by objective evidence of record. The fact that Bourdoncle and Herring relate to molding rocket motor case insulation does not provide a proper reason to support their combination because the cited references do not suggest the desirability of the combination. However, nothing in Bourdoncle and Herring, or any of the other cited references, provides any motivation to combine to produce the claimed invention. Furthermore, as previously discussed, Bourdoncle specifically discloses that its thermal protection is not formed into a sheet and, in fact, is unsuitable for forming into a sheet. As such, Bourdoncle teaches away from combination with the cited references to produce the claimed invention.


### ENTRY OF AMENDMENTS

The proposed amendments to claims 1 and 2 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Further, the amendments do not raise new issues or require a further search. Finally, if the Examiner determines that the amendments do not place the application in condition for allowance, entry is respectfully requested upon filing of a Notice of Appeal herein.

### CONCLUSION

Claims 1-10 and 21 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. As noted in previous Office Action responses, Applicant considers claim 1 to be generic to the species of Group A and notes that upon allowance of such a generic claim, claims 2-10 and 21 would also be allowable. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,



Katherine A. Hamer  
Registration No. 47,628  
Attorney for Applicant(s)  
TRASKBRITT  
P.O. Box 2550  
Salt Lake City, Utah 84110-2550  
Telephone: 801-532-1922

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